(2)

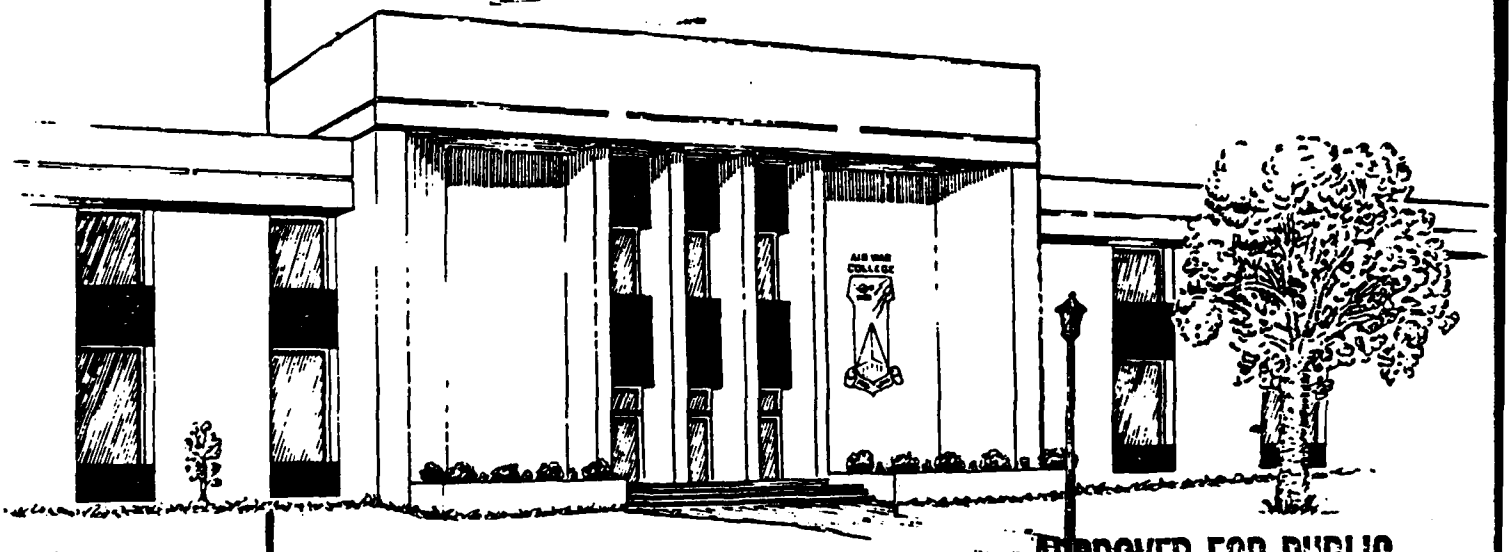
AIR WAR COLLEGE

RESEARCH REPORT

AIRLAND BATTLE AND ITS IMPLICATIONS FOR TACTICAL AIRLIFT

COLONEL DENNIS W. THOMPSON, USAFR

1988



AIR UNIVERSITY
UNITED STATES AIR FORCE
MAXWELL AIR FORCE BASE, ALABAMA

AIR WAR COLLEGE
AIR UNIVERSITY

AIRLAND BATTLE AND ITS IMPLICATIONS FOR TACTICAL AIRLIFT

by

Dennis W. Thompson
Colonel, USAFR

A RESEARCH REPORT SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE RESEARCH

REQUIREMENT

Research Advisor: Lieutenant Colonel Richard L. Skoog

MAXWELL AIR FORCE BASE, ALABAMA

April 1988

DISCLAIMER

This research report represents the views of the author and does not necessarily reflect the official position of the Air War College or the Department of the Air Force. In accordance with Air Force Regulation 110-8, it is not copyrighted, but is the property of the United States government.

Loan copies of this document may be obtained through the interlibrary loan desk of Air University Library, Maxwell Air Force Base, Alabama 35112-5564 (Telephone: [205] 293-7223 or AUTOVON 875-7223).

AIR WAR COLLEGE RESEARCH REPORT ABSTRACT

TITLE: **AirLand Battle and Its Implications for Tactical Airlift**

AUTHOR: **Dennis W. Thompson, Colonel, USAFR**

The Army's current doctrine, the AirLand Battle, is based on the principle of attack. It uses all available combat means, including air power, to seize the initiative and uses it aggressively to win against a numerically superior opposition. The logistical support requirements of the modern, nonlinear battlefield will present significant implications for tactical airlift. The fluid battlefield of the AirLand Battle, with discontinuous lines of supply, will make airlift essential in sustaining the ground forces. Tactical airlift doctrine is committed to support Army logistical requirements at any level of conflict. The vulnerability of tactical airlift in a hostile environment raises questions about the capability of tactical airlift to provide the required logistical support. To be valid in the employment of tactical airlift forces, Air Force doctrine must be a definitive statement on mission capabilities and limitations on the modern battlefield.

BIOGRAPHICAL SKETCH

Colonel Dennis W. Thompson received a B.S. degree from North Texas State University in 1966 and is a graduate of Marine Corps Command and Staff. He is an experienced tactical airlift pilot who served in Southeast Asia as a C-130 instructor pilot. Subsequent assignments included the Wing Standardization/Evaluation Pilot in the 433 Tactical Airlift Wing and instructor duties in the wing's unique Modular Airborne Fire Fighting Mission. Colonel Thompson later served as the Operations Officer of the 911 Tactical Airlift Group and the Commander of the 305 Aerospace Rescue and Recovery Squadron. He is the recipient of the Meritorious Service Medal and the Air Medal with two oak leaf clusters, among other military decorations. Colonel Thompson is a graduate of Air War College, class of 1988.

TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

Doctrine is the philosophy used by a military force to guide its conduct in battle. The Army's current doctrine, the AirLand Battle, is based on securing or retaining the initiative and aggressively defeating the enemy. It incorporates the extended battlefield and the integrated battlefield to counter current Soviet land warfare doctrine. The conduct of the deep attack is essential to the tactical execution of this doctrine. Technology has changed contemporary warfare in that some established tenets may no longer be valid. The AirLand Battle will have forces intermixed in depth while maneuvering to conduct attacks and counterattacks. Maneuver will be utilized to the extent that the integrity of initial boundaries will not remain intact. Large quantities of supplies and equipment will be expended at a tremendous rate. The logistical support requirements of the modern, nonlinear battlefield pose major problems for today's logistics planners.

The purpose of this paper is to examine the logistical considerations of the AirLand Battle Doctrine and its significant implications for tactical airlift. To accomplish this purpose, it will be necessary to closely

look at the evolution of the Army's AirLand Battle and why the Army feels so strongly that it is the way to fight and win. It will be necessary to look at the operational concepts of the Soviets and, to lesser extent, their land warfare doctrine. The Soviets with their large numerical superiority and sophisticated equipment will be a formidable opponent on the modern battlefield.

To support the AirLand Battle doctrine, tactical airlift is committed to sustaining ground forces on the battlefield. A review of the ground-to-air and air-to-air threats to airlift will be necessary to validate the capabilities and limitations of airlift forces. There have been significant efforts made to increase the survivability of tactical airlift through improved tactics and training. The survivability of airlift resources will be an important factor in sustaining ground forces on the fluid battlefield envisioned in the AirLand Battle doctrine. This paper will determine the capabilities of airlift forces to meet the logistical requirements of AirLand Battle and subsequently to validate tactical airlift doctrine and its "you call, we haul" tenet.

CHAPTER II

AIRLAND BATTLE DOCTRINE

In the late 1970s, many in the Army began to question its stated doctrine, the Active Defense. There was concern that the doctrine was invalid in Europe where the Soviets enjoyed such a large numerical superiority. The Active Defense doctrine emphasized defense with superior firepower. It was orientated towards a linear engagement of forces and relied on heavy attrition of enemy attackers to stop the enemy's advances. In essence, the implied purpose of the Active Defense doctrine was to avoid defeat rather than to achieve victory. Thus, the Army doctrine of Active Defense was discarded for the current doctrine of AirLand Battle in 1982. It was an offensive orientated concept that emphasizes tactical maneuver and added depth to the battlefield to defeat a Soviet frontal assault.[1]

To fully understand the rationale for the AirLand Battle doctrine, it is necessary to review Soviet doctrine. The Soviets can be expected to exploit their numerical superiority by massing fast-moving and heavily armored forces to breach NATO defenses. These forces will deploy in a two-echelon configuration with the first echelon maintaining pressure on the defense to find a weakness. Second echelon forces will attack a weak breach to reach

deeper objectives. These combined breakthroughs will then be exploited by the Operational Maneuver Group (OMG) which is a large, self-sustaining force not part of the first and second echelon forces.[2] The large scale OMG attacks will be conducted in conjunction with air assaults and airborne landings against key objectives deep in NATO's defenses. These attacks shift the focus of the conflict to the opponent's rear, forcing him to defend in two directions. The OMG can function as a single entity or disperse within the rear area attacking key targets in the form of multiple strike forces.[3]

Soviet ground forces will be supported by Soviet airpower as directed by the operational front army commander. These air forces will normally consist of strike aircraft, reconnaissance aircraft, and utility helicopters to support the ground armies during the battle. The front commander is able to dictate tactical objectives and theater strategy to the Soviet air component which ensures unity of purpose. This differs substantially from the organizational structure of NATO forces which have equivalent air component commanders. This concept increases the importance of integrated air and ground operations by NATO forces.[4]

AirLand Battle is explained in the Army's key warfighting manual, Field Manual (FM) 100-5, Operations. It applies the classical principles of war and the dynamics of combat power to the contemporary battlefield. The Army will

apply combat power at the operational and tactical level. Its objective is to secure or retain the initiative and to exploit it to achieve the desired military results. Planning will include decisive objectives, but stress flexibility that capitalizes on enemy vulnerabilities. The AirLand Battle doctrine clearly makes the offensive a prerequisite for success on the battlefield.[5]

The AirLand Battle integrates three simultaneous battles into its concept of operations. Close, deep, and rear operations constitute the dynamics of combat power which determine the combined impact on the course of battle. Close operations are the more critical in that they comprise the efforts to win current engagements. At the operational level, corps and divisions will utilize maneuver, close combat, and fire support to win the current battle. Eventually, the success of deep and rear operations will have impact on the outcome of the close operation battle.[6]

Deep operations consists of interdicting the enemy's supplies, reserve forces, and communications. It directly influences the conditions in which future close operations will be conducted by preventing the enemy from committing these resources at a time and place of his choosing. Deep operations may consist of air interdiction, ground forces through maneuver, special operating forces, or a combination of these forces. However, deep operations must be utilized against targets that directly threaten the success of the

larger course of battle. Maintaining the initiative is imperative to successfully execute deep operations which will achieve a decisive impact on the enemy.[7]

Rear operations are critical for subsequent operations. They ensure the ability to provide continuity of operations including the capability of exploiting any opportunity without delay. Rear operations consist of providing an environment in which reserves can be assembled and moved, fire support can be redeployed, supplies can be maintained, and command and control can be exercised. These functions with their support to currently engaged units have a direct impact on the current battle. For that reason, rear operations will be targeted by enemy forces and must be prepared to defend themselves without diverting a large number of assets from the forward battle. Threats to rear operations must be met while minimizing effects on the close operations.[8]

Command and control are essential to the execution of close, deep, and rear operations. However, an important principle of the AirLand Battle doctrine is its emphasis on delegation of authority. Plans are provided by higher headquarters to establish the intent and concept of operations, but subordinate units have the freedom to vary from the plan at critical points in the battle to achieve their objectives. Mission orders consist of what the objective is rather than detailing how the objective is to

be achieved. This enables tactical leaders to position themselves to respond to changing circumstances and to accomplish the mission without additional orders. By understanding the purpose of the operation, tactical commanders can respond decisively even when unanticipated situations develop. Above all, in the AirLand doctrine the purpose of command and control is to enable friendly forces to respond more quickly and effectively than the enemy.[9]

The emergence of new technologies has been the basis for the AirLand Battle doctrine. New computers and microprocessors will distribute the information needed to execute the AirLand Battle doctrine. These technologies make it possible to acquire mobile targets deep in the enemy rear and to successfully attack these targets. Precision-guided munitions (PGM) have made it possible to exploit the Soviet second echelon using conventional means.[10] By utilizing airborne platforms to electronically view the battlefield, maneuver and firepower can be utilized decisively against a numerically superior force. Data can now be rapidly turned into intelligence and disseminated by all-source intelligence centers. This same technology will provide the capability to deny electronic intelligence to the enemy while it protects friendly intelligence sensors. Exploiting high technology against the enemy is a basic tenet of the AirLand Battle doctrine and its successful execution.

The AirLand Battle doctrine caused quite a controversy in NATO. The Germans were particularly concerned about the political implications of a doctrine which advocated deep, offensive action.[11] After initial skepticism, NATO developed an offense orientated doctrine similar in some respects to AirLand Battle. The doctrine, Follow-On Forces Attack (FOFA), has generally been accepted by all NATO countries. The FOFA concept and the AirLand Battle both call for the destruction of enemy follow-on forces before they reach the central battle. A major difference in the two doctrines is that AirLand Battle differentiates between the three distinct battles of rear, close-in, and deep. FOFA addresses only the deep or interdiction strike after the central battle has begun. Even though the AirLand Battle concept is bigger in scope than FOFA, FM 100-5 is fully compatible with NATO's Allied Tactical Publication ATP 35(A), Land Force Tactical Doctrine. Assurance has been provided to NATO allies that AirLand Battle does not include preemptive ground attacks into Eastern Europe. Also, the latest version of FM 100-5 dated 5 May 1986 acknowledges that the use of nuclear weapons will be a strategic decision made by political authorities.[12] There are philosophical differences between FOFA and AirLand Battle but both doctrines have been developed to exploit Soviet offensive doctrine by destroying

enemy forces before they are able to engage in the close-in battle.

Sustaining the logistical requirements of the AirLand Battle has become increasingly complex in modern warfare. FM 100-5 states, "An Army's ability to marshall, transport, and distribute large quantities of material and to maintain the men and equipment of large units can make the decisive difference between victory and defeat in high- or mid-intensity conflict."[13] To fight effectively, the Army must be able to sustain its forces with an adequate combat service support system. The operational maneuvers projected in the AirLand Battle doctrine must be sustained in order to pursue tactical opportunities to exploit the weaknesses of the enemy. This is especially true at the tactical level where the unit's capability to maneuver or to mass firepower is directly dependent upon its logistical support. Today's complex weapon systems, fighting on a highly lethal battlefield, will consume large stocks of materials.

Planning is essential to support the in-depth strikes of the AirLand Battle doctrine. Requirements will have to be anticipated to furnish the forces and equipment at decisive times and places during the execution of the operation. Logistical planners must understand the "big picture" while simultaneously supporting ongoing phases of the battle. In the field, expenditure rates of fuel and

ammunition will have to be adjusted so as not to compromise the ability of the unit to wage battle. The logistics supply line cannot be interrupted without impacting combat capability. For that reason, alternate methods of providing sustainment must be available. Disruptions of logistics support through temporary or permanent losses of key facilities including airfields must be expected.[14]

Responsiveness is an essential requirement for combat support systems. Surge requirements arise frequently when it is necessary to stop an enemy breakthrough or to fully exploit a successful operation against the enemy. Improvisations will be required to meet these unforeseen contingencies for the best plans can go wrong. Contingencies may mean that unique operating procedures may have to be implemented which have inherent risk in order to continue to provide the necessary support. This requires a certain flexibility which has been a traditional trait of the American military man.[15]

The deep attack against the Soviet echelon has an impact on logistical support which is of substantial magnitude. It differs significantly from the logistics requirements of the traditional battlefield consisting of a frontal assault. The differences are illustrated in Figure 1.[16]

Traditional Battlefield	Deep Attack
Wide (division front)	Narrow (axis of advance)
Shallow (10 to 20 kilometers behind the forward line of own troops)	In-depth (50+ kilometers beyond the forward line of own troops)
Mutually supporting (brigades on line)	Independent axis
Continuous supply lines from corps	Discontinuous supply lines
Defensive battle with limited offenses	Offensive battle
Homogeneous combat service support requirement	Dichotomous combat service support requirements

Figure 1.

The deep attack and its logistical requirements will affect tactical options available to the field commander. First, what will be the objectives of the deep strike for it is difficult to successfully change the mission objectives once the attack has begun? Second, a decision must be made to either keep the supply lines open by protecting them or perform the strike on a self-sustaining basis. The strike force has an organic capability to support itself, but this could be very short-lived depending upon the intensity of the battle. Any attack plan must be cognizant of resupply capabilities and the resources available to sustain the deep strike force. The intense level of battle anticipated during the deep strike will certainly strain the capability of support forces. As forward stocks are used up, the problems in sustaining effective support will depend

increasingly on the ability to move material from stockpiles in the rear. Beyond 70 kilometers from the forward line of own troops (FLOT), it will be unlikely that an adequate supply line can be maintained.[17] The discontinuous battle lines associated with the deep attack will compound the difficulties of the support system. Also, the sheer volume of supplies that will be required due to the high consumption of military material is staggering. "Today, it is estimated that one armored division equipped with M1 tanks will consume over 600,000 gallons of fuel per day, more than twice the consumption of Patton's entire army."[18]

CHAPTER III

AIRLIFT DOCTRINE

United States Air Force airlift doctrine is officially stated in Air Force Manual (AFM) 1-1, Basic Aerospace Doctrine of the United States Air Force. This manual describes how the Air Force will plan and conduct major campaigns and battles in conjunction with other services and allied forces. AFM 1-1 articulates the most basic and fundamental beliefs for the deployment of aerospace forces to achieve an objective. These general truths and accepted assumptions are the basis on which Air Force airlift doctrine supports military and national goals. This doctrine provides the foundation on which the principles of airlift are based. These principles are not separate entities, but are interrelated elements of warfare that have proven successful in conducting war. AFM 1-1 not only has a profound influence on the planning and deployment of airlift forces, but it also provides the basis for serious thinking about the validity of these concepts.[19]

FM 100-5 stresses the importance of Air Force airlift forces in rapidly moving personnel and supplies in support of theater objectives.[20] Airlift missions will contribute directly to the land operations of the AirLand Battle and its nonlinear battlefield. The Air Force

commitment to sustain ground forces with airlift support is quoted from AFM 1-1.

> Airlift objectives are to deploy, employ, and sustain military forces through the medium of aerospace. The airlift mission is performed under varying conditions, ranging from peace to war. As a combat mission, airlift projects power through airdrop, extraction, and airlanding of ground forces and supplies into combat. Through mobility operations, the joint or combined force commander can maneuver fighting forces to exploit an enemy's weaknesses. As a combat support mission, airlift provides logistics support through the transportation of personnel and equipment. In peacetime, airlift provides the opportunity to enhance national objectives by providing military assistance and civilian relief programs. Airlift, therefore, accomplishes the timely movement, delivery, and recovery of personnel, equipment, and supplies, furthering military and national goals.
>
> Airlift may be performed from a strategic or tactical perspective. Strategic (intertheater) airlift transcends the boundary of any one theater and is executed under the central direction of higher authority, normally in support of a more pervasive or overall effort. In contrast, tactical (intratheater) airlift is performed within a theater of operations and supports theater objectives through the rapid and responsive movement of personnel and supplies.[21]

The Air Force 2- series manuals describe the operational doctrine and its applications to force capabilities and operational mission areas. It provides prescribed methods of deploying airlift forces to achieve stated objectives. To understand the tactical airlift role in winning wars, it is necessary to look at the operational doctrine described in AFM 2-4, Aerospace Operational Doctrine: Tactical Air Force Operations, Tactical Airlift. It describes the mission of tactical airlift to meet Army logistical requirements by delivering personnel, supplies,

and equipment on a sustained basis at any level of conflict.[22] In AirLand Battle, tactical airlift must work closely with the unified ground commander. Due to constantly changing battlefield conditions, close coordination between the Army and the Air Force will be essential. The effective use of airlift enables the ground commander to rapidly shift the focus of the battle in order to successfully exploit enemy weaknesses. Airlift support for the Army's combat mission can be provided by airland, air extraction, or airdrop. Additional theater airlift can also be provided by strategic airlift assets when available. Strategic airlift forces have inherent tactical capability which can greatly enhance air mobility for military forces.

Specific employment procedures for tactical airlift are established in Military Airlift Command Regulation 55-130, C-130 Tactical Airlift Operations General Information. These procedures include airland, extraction, or airdrop to deliver personnel, supplies, and equipment to support the Army's combat mission. Airland operations are accomplished by moving supplies, equipment, and personnel to an arrival airfield which can be austere and with a length of only 3,000 feet. Once delivered, another mode of transportation is utilized to move the shipment to its final destination. There are several advantages to airland operations over airdrop, so it is the preferred method of deployment.[23] By airlanding, larger quantities of equipment

and supplies can be transported and the possibility of damage is less likely to the cargo. The primary disadvantages of airland operations are that landing fields must be prepared or secured and aircraft are exposed to enemy ground fire while on the ground.

Airdrop is a method of delivering supplies and equipment from an aircraft to ground forces. The advantages of airdrop operations are that they can be made directly to the using units and that exposure time to enemy fire is reduced. Also, airdrops can be made to special operations units behind enemy lines. The requirements for landing zones are negated with airdrops as well as the need for material handling equipment to offload the aircraft. The disadvantages to airdrop operations are that they are affected by weather and high winds, plus airdrop loads are smaller than airland loads. Airdrop operations also require specially trained personnel to rig the airdrop load, and there is always the possibility of the load being damaged during the drop.[24]

Airborne operations can be conducted to insert an assault force of a particular composition into a required place at a precise time. These operations can effectively accomplish a number of objectives including a link up with friendly forces or to seize ground positions from which further operations can be staged. Special operations forces can also be airdropped with great secrecy. High Altitude

Personnel airdrops can be very effective utilizing free-fall procedures in combination with maneuverable parachutes.[25]

The Low Altitude Extraction System (LAPES) is an air delivery method in which supplies and equipment are extracted by parachutes from an aircraft flying approximately four feet above the ground. The advantages of LAPES are that it can be utilized when excessive winds or low ceilings preclude airdrops. It also minimizes exposure to enemy air defenses and is very accurate. The load comes out of the rear of the aircraft and touches down at more than 100km/h and slides along on the ground surface until it comes to a stop.[26]

CHAPTER IV

THE THREATS TO TACTICAL AIRLIFT

Tactical airlift aircraft are vulnerable to air and ground threats. The performance capabilities of airlift aircraft are inferior to most combat aircraft and they are unarmed. The air defense systems maintained by the Soviet Union are formidable. They consist of fighter aircraft, surface-to-air missiles, antiaircraft artillery, and a sophisticated radar system. Tactical transport aircraft face a large variety of Soviet weapon systems that are able to provide integrated and overlapping air defense coverage. The Soviets have developed their tactical air defenses so that even the company level has their own organic air defense unit. These units are able to provide in-depth air defense and they are mobile.[27]

The Soviet air defense includes both area defense and point defense weapons. Their air defense forces, as other forces, are echeloned on the battlefield applying the principle of in-depth defense. The three objectives of the Soviet air defense are to destroy the enemy's air capability on the ground, to destroy airborne enemy aircraft before they become a threat, and to destroy enemy aircraft that have penetrated Soviet airspace.[28] Antiaircraft weapons are provided to all levels of command to produce effective

combined-arms formations. Mobility is emphasized in developing these systems so that they can be rapidly relocated.

The Soviet air defense attempts to win air superiority over the battlefield enabling them to deter enemy air attacks, thus protecting their ground forces. Air defense in Soviet doctrine is an integral part of the combined arms operation directed by the frontal commander. Surface-to-air missiles and antiaircraft artillery are effective against fixed-wing aircraft and helicopters operating at low altitudes.[29] This combination of air defenses would be highly lethal to any airlift aircraft. The antiaircraft threat would primarily come from the SA-7 Grail, the SA-9 Gaskin, and the ZSU-23-4. The ZSU-23-4 has a very high rate of fire and is very mobile. On the battlefield it can keep pace with fast-moving armored units and can fire on the move.[30]

Soviet air defense capabilities have been enhanced by the deployment of late-model air superiority fighters. The latest models, the Fulcrum and the Flanker, possess look-down and shoot-down radars and advanced air-to-air missiles that can engage low-flying aircraft. Enemy fighters and attack aircraft with their associated weapons will conduct a wide spectrum of air operations in support of Soviet ground forces. The Soviet strategic defense force

includes 2,250 interceptor aircraft which could be augmented by 2,100 interceptors drawn from other Soviet air forces.[31]

Rotary wing attack helicopters will also be a significant threat to low-flying transport aircraft. These helicopters are extremely maneuverable and can fly or hover at very low altitudes using terrain, vegetation, and man-made objects for concealment. During tactical exercises utilizing helicopters as aggressors, the helicopters were never seen by the airlift aircraft until engagement. At that point, it was too late for evasive action. High performance fighters also have difficulty in locating and engaging helicopters. The Soviets currently have approximately 20 attack helicopter regiments consisting of up to 60 attack helicopters in each regiment. Their inventory currently consists of heavily armed HIP and HIND helicopters, but it is expected that a new attack helicopter, the HAVOC, will be deployed soon. The HAVOC is similar to the U.S. Army Apache attack helicopter and will greatly enhance Soviet combat capability. In addition, a new helicopter, the HOKUM, is being developed for the air-to-air combat role.[32] There is currently no Western counterpart to the HOKUM in development. Armed with a cannon and air-to-air missiles, the HOKUM will be a dangerous threat to both rotary wing and fixed wing aircraft.

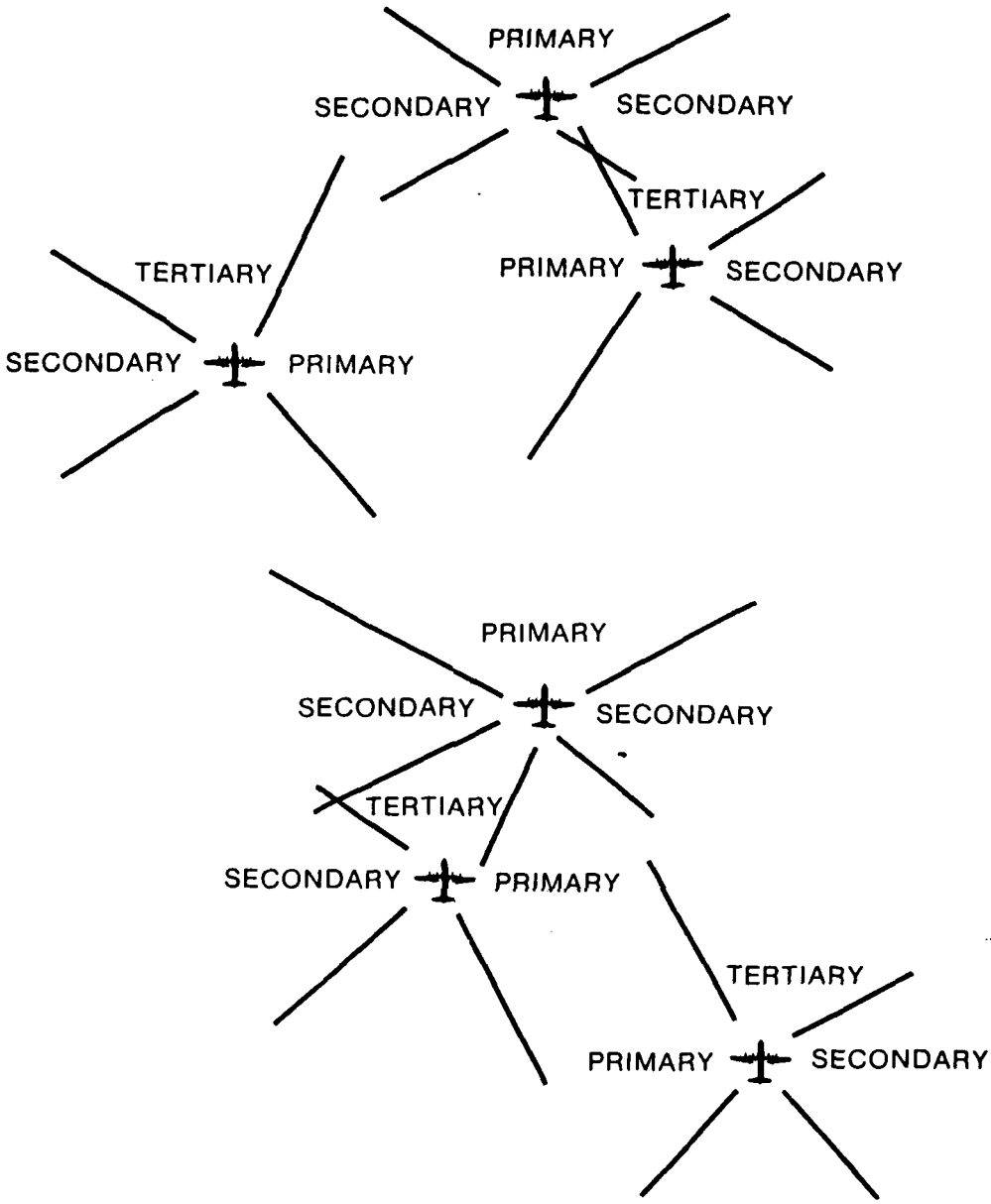
Red Flag and Maple Flag exercises have emphasized the threats faced by the airlift community. As a result, the need for more flexibility in tactics and improved equipment became readily apparent. Revitalized training programs needed to be developed for flying in a hostile environment. The use of current intelligence needed to become an integral part of aircrew mission planning. This new interest in airlift tactics resulted in the establishment of the Combat Aircrew Training School (CATS) at Nellis AFB, Nevada, and the Advanced Airlift Tactics Training Center (AATTC), at St. Joseph, Missouri. These schools have been instrumental in developing alternate airlift tactics and in training aircrews in the proper execution of these tactics.

In the past, tactical airlift typically flew a visual in-trail formation at low levels. This tactic was designed for mass airborne assaults onto large drop zones during World War II. The in-trail formation is extremely vulnerable in its 6-o'clock position where it is virtually blind. In addition, visual acquisition of one aircraft by the threat virtually ensured the acquisition of the other aircraft in the formation since they are normally 2,000 feet in-trail. To correct these deficiencies, several tactical formations have been developed which optimize terrain masking and mutual support within and between formation elements. With changes in the terrain or the perceived

threat, the tactical situation may require a transition from one tactical formation to another during the route. These formations enhance formation maneuverability and flexibility, but require thorough mission planning and briefings.

Fluid trail formation provides element wingmen with maximum flexibility while maintaining formation integrity. Spacing between aircraft can vary dependent on mission requirements, but wingmen can maneuver up to 90 degrees on either side of the in-trail position behind the lead. This formation breaks up the symmetrical visual pattern of the standard formation and it provides more freedom for evasive maneuvers. It not only optimizes terrain masking for the formation, but provides mutual support in the 6-o'clock position. The element lead is primarily responsible for clearing the flight's front quadrant, while the wingmen clear to the side and rear quadrants of the element. The right wingman is primarily responsible for the left quadrant and rear of the flight, while the left wingman is primarily responsible for the right quadrant and rear of the flight (Figure 2).[33]

The modified "V" formation normally consists of three 2-ship elements with the wing elements flying 9,000 feet and 18,000 feet respectively behind the lead element. The wing elements are free to maneuver on an arc behind the lead element, while element wingmen maintain a fixed



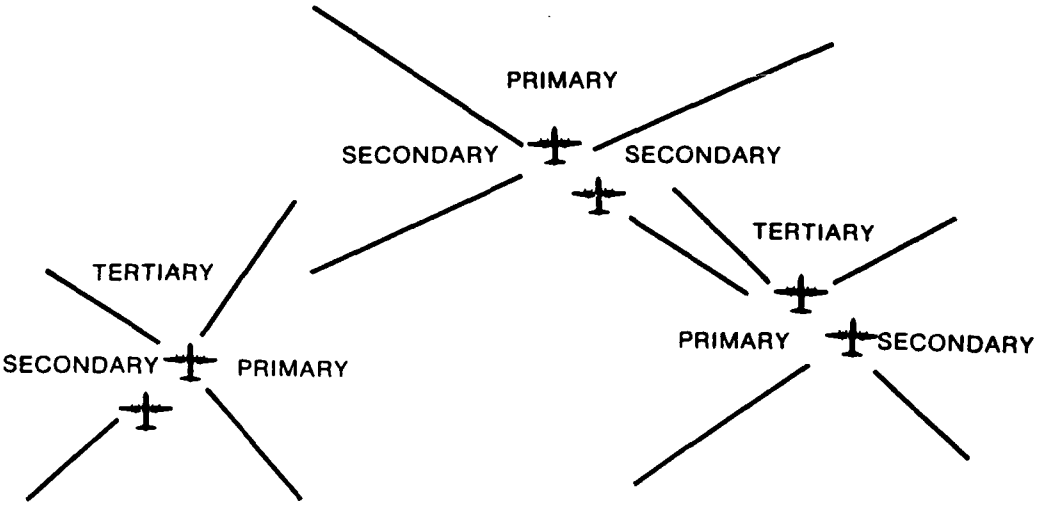
C-130 FLUID TRAIL MUTUAL SUPPORT RESPONSIBILITIES

Figure 2.

position on each element lead. The modified "V" is a wide lateral formation, but it can rapidly transition to a modified fluid trail formation to pass through a narrow passageway. Since the modified "V" formation is a variation of fluid trail, visual support responsibilities for each element and wingmen are the same as in the fluid trail formation (Figure 3). This formation improves fighter escort coverage by shortening the length of the formation, but retains some formation flexibility.[34]

The line abreast formation requires a wide lateral dispersion, but it is useful over areas that provide minimal terrain masking, such as a desert area or over water. It can also be useful when a line of communications must be crossed because it minimizes formation exposure time. Line abreast also optimizes visual mutual support in the 6-o'clock position. The disadvantage is that it allows little flexibility during turns into the wingmen. It is possible, however, to have each wingman move toward an in-trail position approaching a turn and return to the line abreast position after the turn. Each aircraft is responsible for behind and beyond the other aircraft in the formation.[35]

The box formation consists of two 2-ship elements in a line abreast formation with at least 6,000 feet spacing between elements. Greater spacing decreases the possibility that a threat will detect both elements at once. The lead



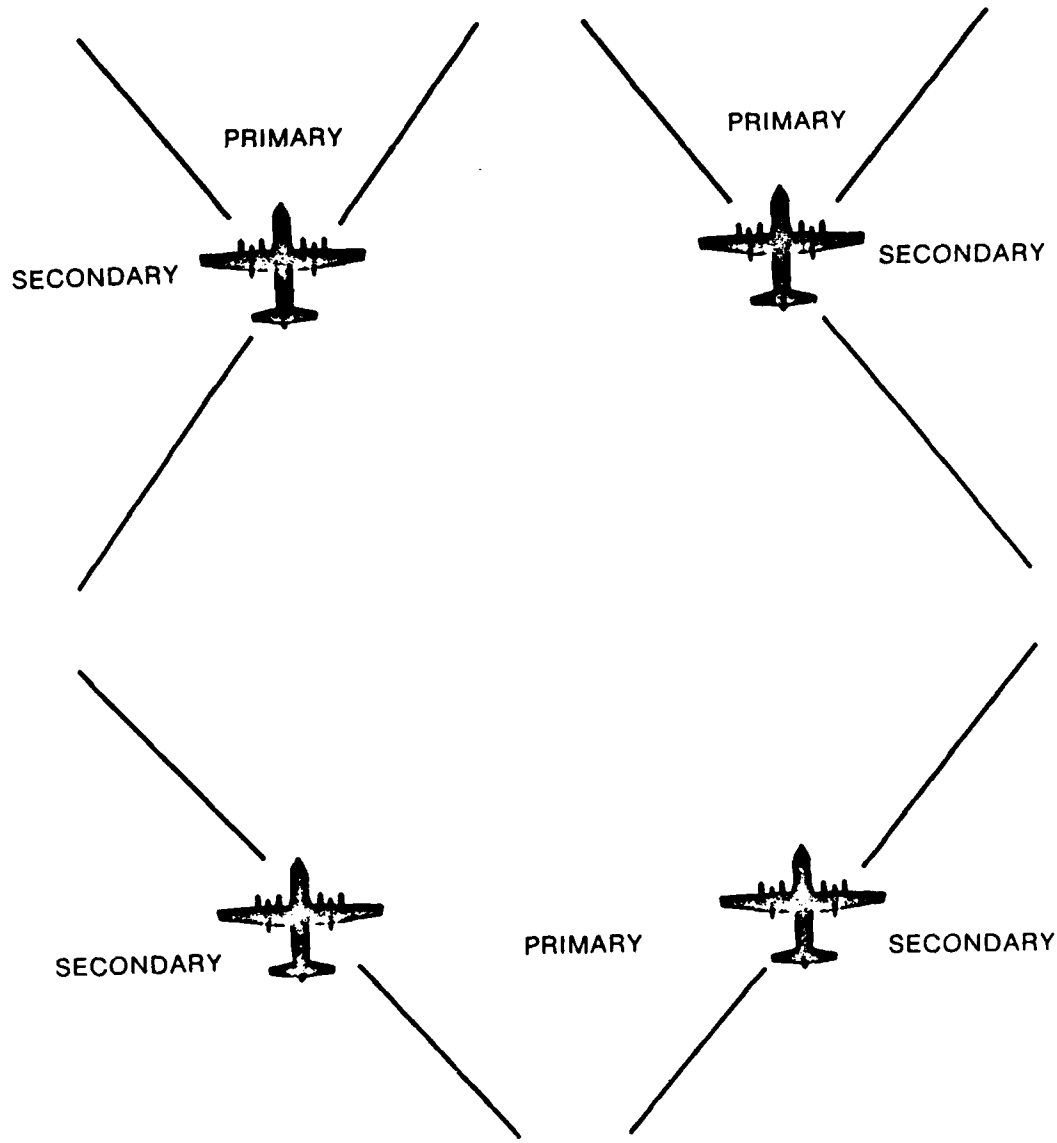
C-130 MODIFIED "V" MUTUAL SUPPORT RESPONSIBILITIES

Figure 3.

element is responsible for clearing the front quadrant while the second element is responsible for the rear quadrant. Both elements are responsible for clearing the side quadrants (Figure 4). Advantages and disadvantages of the box formation are similar to the line abreast formation.[36]

Individual ingress can also be utilized when each aircraft or element flies a separate route to a rendezvous point to rejoin before proceeding to objective area. This tactic can be used to avoid detection and it disguises the true objective area. Timing is critical to make the established rendezvous time and the maneuver rapidly gets more complicated as the number of aircraft increases. Individual ingress can also be used by each aircraft or element to fly across the drop zone on a different heading. By varying the heading across the drop zone and the direction of escape, the threat from enemy ground forces can be reduced. Again, timing is critical to avoid conflicts over the drop zone as each aircraft or element crosses within a very short time period.[37] This tactic can be effective in preventing predictable targeting by the enemy.

Although these tactics are an improvement, their use will not ensure a successful mission unless tactical fighter support is available. It has been demonstrated many times at Red Flag that with a coordinated strike force, airlifters can successfully enter a hostile environment, deliver the load, and safely return. The coordination is complex and it



C-130 BOX MUTUAL SUPPORT RESPONSIBILITIES

Figure 4.

takes a sophisticated strike force consisting of air superiority fighters, electronic warfare aircraft, and attack aircraft to eliminate the ground threats. In addition, support from an AWACS aircraft is needed for air battle management and identifying threats to the strike force. Depending upon the length of the mission, tanker support may be required to air refuel the strike force.

Airlift survivability can be improved by obtaining electronic countermeasures equipment (ECM). Traditional ECM have been orientated to the heavy bombers of the Strategic Air Command (SAC) or the tactical fighters of the Tactical Air Command (TAC). Existing technology can be used to protect airlift aircraft in a threat environment which could potentially include SAMs, AAAs, fighters, and GCI radars. The ECM systems must be tailored to large, slow aircraft with large radar cross sections. This deficiency was identified in a USAF Scientific Advisory Board (SAB) Study of 1982, "The Enhancement of Airlift in Force Projection." This study recommended defensive equipment be installed in transport aircraft to counter infrared (IR) and radar threats. This concept of defensive systems for transport aircraft resulted in the development of Survivability Augmentation for Transport Installation-Now (SATIN).[38] The SATIN kit is currently being tested on a C-130 aircraft to provide a self-defense capability.

The kit consists of a radar warning receiver (RWR), a missile warning radar (MWR), and a chaff/flare countermeasure dispenser. The RWR, the AN/ALR-69, gives warning of threat radar systems by giving an audio alert and a visual indication of the threat's relative bearing and range. This enables the aircrew to begin evasive maneuvers to avoid the hostile threat. The MWR, the AN/ALQ-156, is designed to detect incoming IR missiles and uses flares as a countermeasure to decoy them. Its pulse-doppler radar detects the range and closing velocity of the missile and automatically begins dispensing flares at the optimum time to decoy the missile. The chaff and flare countermeasures dispenser is the AN/ALE-40 which is standard for tactical forces. The system includes four dispensers on the left paratroop door and four on the right paratroop door with half for chaff and half for flares. The associated controls and displays for SATIN are mounted at the navigator's station.

The SATIN system is designed so that it can be installed without permanent modification to the aircraft. The kit can be installed or removed by a four-man maintenance team in less than eight hours.[39] An example of the simplicity of installation of the system is the AN/ALE-40 chaff and flare dispenser. The paratroop doors are quickly replaced by paratroop doors previously modified with the AN/ALE-40. The SATIN kits can be prepositioned in

theaters where C-130s may face a hostile threat without the expense of modifying the entire fleet. The SATIN kit will not make a transport aircraft invincible., but it will greatly improve survivability especially when used with evasive maneuvers. Threat recognition and effective counter tactics are essential for the aircrew to maximize the capabilities of SATIN.

The use of Night Vision Goggles (NVGs) also has the capability to enhance the survivability of the C-130 aircraft in a hostile environment. Until now, low altitude flights using terrain masking were only possible in daylight conditions for airlift aircraft with the exception of the MC-130 Combat Talon. By using NVGs, a C-130 aircraft can be navigated and flown under night conditions at approximately 500 feet above ground level completely blacked out. NVGs could also enable a pilot to complete blacked out landings at small, austere airfields. This capability has not always existed for early NVG had definite limitations. The second-generation NVGs enabled the user to see at night under starlight conditions, but vision was affected by light level, terrain contrast, and atmospheric conditions. The goggles were helmet mounted and became fatiguing due to their weight on longer missions. Due to these limitations, NVG night flying was generally limited to helicopters with their much slower speeds.

Third-generation NVGs have significant technological improvements. Their exceptionally high cathode sensitivity and contrast reproduction are well suited for C-130 night operations. Third-generation NVGs have a wide field of view enabling the user to estimate distances and identify terrain features. The new goggles are also helmet mounted, but their lighter weights make them much less fatiguing. The airlift community has not exploited this technological breakthrough, but NVGs can expand airlift capabilities while simultaneously improving survivability.

CHAPTER V

CONCLUSION

Clearly, the U.S. Army doctrine is based on the principle of offense. It applies the classical principles of war and the dynamics of combat power to the contemporary battlefield. AirLand Battle is based on synchronizing all available combat means, including air power, to seize the initiative and use it aggressively to win battles and campaigns. The U.S. Army strongly feels that this doctrine can be successful against the massive Soviet threat and that it is compatible with the NATO land force doctrine of FOFA. The AirLand Battle doctrine furnishes the foundation for subordinate doctrine, force structure, and material acquisition process for the Army. It provides the basis for individual and unit training and is emphasized at all levels of professional military education. A distinguished speaker lecturing to the Air War College class of 1988 said, "The Army lives its doctrine every day, the Air Force uses it when it's convenient, and the Navy ignores it."[40]

If it can be said that the Air Force selectively uses its doctrine, what can be said of the tactical airlift doctrine in AFM 2-2 which was published in 1966? Can tactical airlift really meet Army logistical requirements on a sustained basis at any level of conflict? I submit that

the current airlift operational doctrine of 22 years is no longer valid. It no longer describes what tactical airlift forces are capable or incapable of doing in the modern threat environment. AirLand Battle doctrine with its fluid battlefield is fully expecting the support of air power including tactical airlift. In actuality, tactical airlift will be decimated in any environment other than a low-intensity conflict. The Ranger airborne assault at Point Salines during the Grenada operation demonstrates the vulnerability of airlift aircraft. The ground fire consisted of only small arms and machinegun fire, but the first two C-130s initially aborted the airdrop due to enemy fire. The resulting piecemeal deployment of airborne forces degraded the effectiveness of the airborne assault.[41]

The success of tactical airlift at Red Flag with fighter support is hardly euphoric. In a mid- to high-level intensity conflict, I find it highly unlikely that strike forces would be available to escort airlift missions. In support of the AirLand Battle, strike assets are committed against Suppression of Enemy Air Defenses (SEAD), Counter Air, and higher priority missions in order to attain air superiority. Improved C-130 tactics are innovative, but hardly enable airlift aircraft to enter high threat environments without fighter escort. These new tactics do contribute to enhanced fighter coverage for the airlift formation and this no doubt explains their success at Red

Flag. Survivability can be improved with ECM equipment and new technology such as third-generation NVGs, but these improvements will never enable tactical airlift to fly at will.

AFM 2-4 needs to be updated to reflect current realities of today's threat environment. The operational doctrine for tactical airlift should be redefined so it can provide guidance for establishing priorities for the development and employment of airlift forces. Doctrine should be a primary consideration in determining the role and force structure of Air Force airlift. Procurement of the C-17 for the strategic and tactical airlift mission is an example of where doctrine was ignored and a mission was developed to support the purchase of a weapon system. By incorporating the capability of performing the tactical mission, the strategic C-17 has been priced out of the tactical airlift business with a cost of approximately $35 billion for 210 aircraft.[42] Given its inherent vulnerability to be attacked from the ground and air, it is unrealistic to expect the costly C-17 to be used routinely as a tactical airlifter. Others share the concern of the battlefield vulnerabilities of the C-17. Former Secretary of the Air Force Verne Orr said, "My worry . . . is that with a limited number of very large, expensive planes like the C-17, the forward commander may not want to order them up to the edge of the battle area."[43] With the acknowledged

shortfall in strategic airlift, it is highly unlikely a C-17 would be exposed to a forward combat zone except as a last resort.

The Air Force must put more emphasis on doctrine, but it must be valid and well-grounded. The doctrine must constantly be reassessed to ensure that it does not degenerate into antiquated dogma. Air Force doctrine must recognize the "jointness" of the AirLand Battle doctrine and be specific on the relationship of air assets in relation to other U.S. forces. Finally, tactical airlift doctrine must make a definitive statement on its capabilities and limitations on the modern battlefield. Only then can the development and employment of tactical airlift forces be effective in the defense of this country.

NOTES

1. Colonel William O. Staudenmaier, "Deep Strike in U.S. and NATO Doctrine," Defense and Foreign Affairs, Vol. XV, No. 2, February 1987, p. 28.

2. Ibid., p. 29.

3. Lt Colonel Stephen T. Rippe, "An Army and Air Force Issue, Principles and Procedures for AirLand Warfare," Air University Review, Vol. XXXVII, No. 4, May-June 1986, pp. 63-64.

4. Ibid.

5. Field Manual (FM) 100-5, Operations (Washington: Department of the Army, 5 May 1986), p. 14.

6. Ibid., p. 19.

7. Ibid., pp. 19-20.

8. Ibid., p. 20.

9. Ibid., pp. 21-22.

10. Staudenmaier, p. 28.

11. Lawrence Freedman, "Logistics and Mobility in Modern Warfare," Armed Forces, Vol. 5, No. 2, February 1986, p. 65.

12. General William R. Richardson, "FM 100-5: The AirLand Battle in 1986," Military Review, Vol. LXVI, No. 3, March 1986, pp. 8-9.

13. FM 100-5, p. 59.

14. Ibid., p. 62.

15. Ibid., p. 63.

16. Lt Colonel Bloomer D. Sullivan, "Logistical Support for the AirLand Battle," Military Review, Vol. LXIV, No. 2, February 1984, p. 5.

17. Ibid., p. 9.

18. FM 100-5, p. 60.

19. Air Force Manual (AFM) 1-1, Basic Aerospace Doctrine of the United States Air Force (Washington: Government Printing Office, 1984), p. v.

20. FM 100-5, p. 49.

21. AFM 1-1, p. 3-5.

22. Air Force Manual 2-4, Aerospace Operational Doctrine: Tactical Air Force Operations, Tactical Airlift (Washington: Government Printing Office, 1966), p. 3.

23. Major David A. Reinholz, "A Way to Improve Our 'Marginal' Counterinsurgency Airlift Capability," Armed Forces Journal International, July 1987, p. 41.

24. Robert Salvey, "Tactical Airlift--Techniques and Aircraft," International Defense Review, Vol. 19, No. 6, 1986, p. 747.

25. Ibid., p. 747.

26. Ibid., p. 747.

27. Captain Brian E. Powers, "Soviet Ground Air Defense Organization," Air Defense Artillery, Winter, 1986, p. 20.

28. Captain Brian E. Powers, "Soviet Ground Air Defense: Doctrine and Tactics," Air Defense Artillery, Summer, 1985, p. 40.

29. Ibid., p. 41.

30. Powers, "Soviet Ground Air Defense Organization," p. 21.

31. Soviet Military Power 1987 (Washington: Government Printing Office, 1987), p. 59.

32. Ibid., p. 80.

33. Military Airlift Command Regulation 55-130, C-130 Tactical Airlift Operations, Vol. I, Chap. 22 (Scott AFB, Illinois: Government Printing Office, 17 September 1985), p. 7.

34. Ibid., p. 7.

35. Ibid., p. 8.

36. Ibid., p. 8.

37. Ibid., p. 8.

38. Major Ray A. Yagher, Jr., "SATIN: Air Approach for Increased Survivability," Airlift, Summer, 1986, p. 5.

39. Ibid., p. 6.

40. Guest Speaker, Lecture to the Air War College Class of 1988, January 1988.

41. Richard A. Gabriel, Military Incompetence: Why the American Military Doesn't Win, Hill and Wang, 1985, reprinted in Case Study: The JCS Crisis Action System and the Grenada Operation, Air War College, Maxwell AFB, Alabama, p. 106.

42. "Pact Signed for First Two Production C-17 Transports," Air Force Times, Vol. 48, No. 25, 1 February 1988, p. 12.

43. Kim R. Holmes, "Air Force Should Reconsider the C-17," Military Logistics Forum, April 1986, p. 52.

BIBLIOGRAPHY

Air Force Manual 1-1. Basic Aerospace Doctrine of the United States Air Force. Washington: Government Printing Office, 1984.

Air Force Manual 2-4. Aerospace Operational Doctrine: Tactical Air Force Operations, Tactical Airlift. Washington: Government Printing Office, 1966.

Cuda, Daniel L., Captain. "AirLand Battle: An Airlifter's Perspective." Airlift, Fall, 1985.

Field Manual 100-5. Operations. Washington: Department of the Army, 5 May 1986.

Freedman, Lawrence. "Logistics and Mobility in Modern Warfare." Armed Forces, Vol. 5, No. 2, February 1986.

Gabriel, Richard A. Military Incompetence: Why the American Military Doesn't Win. Hill and Wang, 1985. Reprinted in Case Study: The JCS Crisis Action System and the Grenada Operations. Air War College, Maxwell AFB, Alabama.

Guest speaker. Lecture to Air War College Class of 1988, January 1988.

Hamill, Alan A., Captain and Peter F. Davis, Lieutenant. "C-Power." Field Artillery Journal, Vol. 54, No. 2, March-April 1986.

Hess, Dean A., Jr., Colonel. "Theater Airlift for Wartime." Airlift, Summer, 1985.

Holmes, Kim R. "Air Force Should Reconsider the C-17." Military Logistics Forum, April 1986.

Matarese, Andrew, Major. "Strategic Airlift Short Fall." Airlift, Winter, 1985.

Military Airlift Command Regulation 55-130. C-130 Tactial Airlift Operations. Volume I, Chapter 22. Scott AFB, Illinois: Government Printing Office, 17 September 1985.

Nelson, Peter J., Major. "JA/ATT Joint Airborne/Air Transportability Training." Airlift, Summer, 1986.

"Pact Signed for First Two Production C-17 Transports." Air Force Times, Vol. 48, No. 25, 1 February 1988.

Pisano, Franco, General. "Air Transport: A Vital Asset." NATO's Sixteen Nations, Vol. 32, No. 2, February-March 1987.

Powers, Brian E., Captain. "Soviet Ground Air Defense: Doctrine and Tactics." Air Defense Artillery, Summer, 1985.

Powers, Brian E., Captain. "Soviet Ground Air Defense Organization." Air Defense Artillery, Winter, 1986.

Reinholz, David A., Major. "A Way to Improve Our 'Marginal' Counterinsurgency Airlift Capability." Armed Forces Journal International, July 1987.

Richardson, William R., General. "FM 100-5: The AirLand Battle in 1986." Military Review, Vol. LXVI, No. 3, March 1986.

Rippe, Stephen T., Lt Colonel. "An Army and Air Force Issue, Principles and Procedures for AirLand Warfare." Air University Review, Vol. XXXVII, No. 4, May-June 1986.

Salvey, Robert. "Tactical Airlift--Techniques and Aircraft." International Defense Review, Vol. 19, No. 6., 1986.

Soviet Military Power 1987. Washington: Government Printing Office, 1987.

Starner, Steven G., Major. "Deep Attack--We Can Do It Now!" Field Artillery Journal, Vol. 54, No. 3, May-June 1986.

Staudenmaier, William O., Colonel. "Deep Strike in U.S. and NATO Doctrine." Defense and Foreign Affairs, Vol XV, No. 2, February 1987.

Sullivan, Bloomer D., Lt Colonel. "Logistical Support for the AirLand Battle." Military Review, Vol. LXIV, No. 2, February 1984.

Yagher, Ray A., Jr., Major. "SATIN: An Approach for Increased Survivability." Airlift, Summer, 1986.